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09/680,277	10/06/2000	Je Hong Kim	2658-0242P	8486

7590

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EXAMINER

RUDE, TIMOTHY L

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 10/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/680,277

Applicant(s)

KIM ET AL.

Examiner

Timothy L Rude

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,8,11,13-16,18 and 19 is/are rejected.
- 7) ☒ Claim(s) 6,9,10,12 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings were received on 09 July 2003. These drawings are accepted by the examiner.

Claims

3. Claims 1-18 are amended. Claim 19 is added.

Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

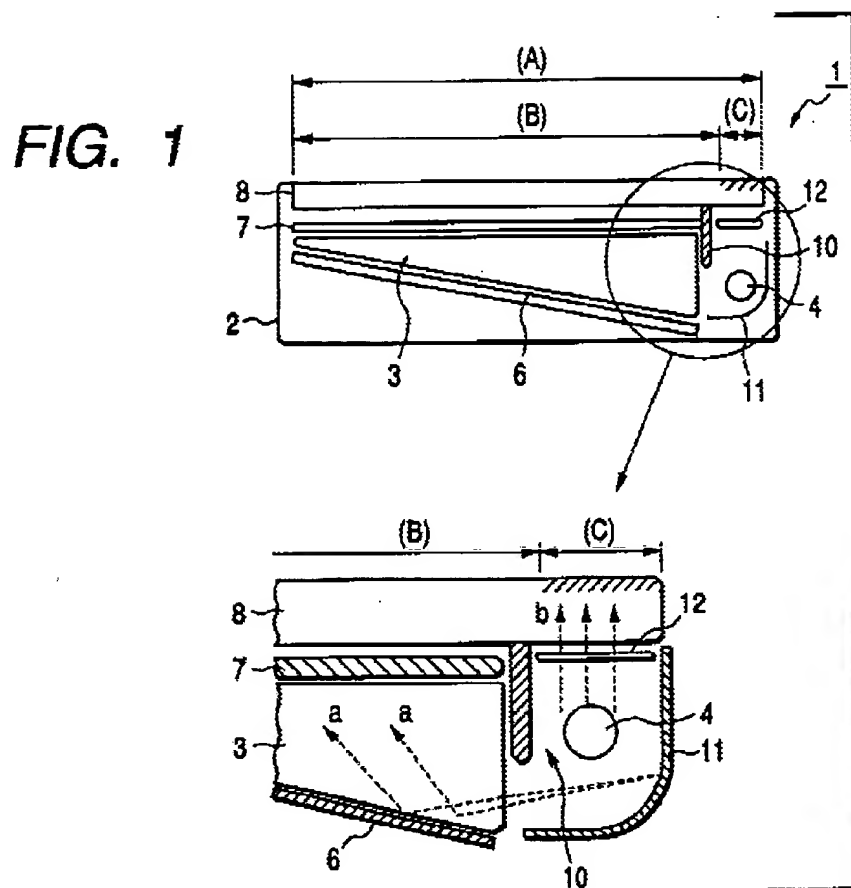
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (APA) in view of Matsushita et al (Matsushita) USPAT 6,317,177 B1.

As to claim 1, APA discloses a back light unit in Figures 1 and 2 (page 1, line 14 through page 4, line 5), in a liquid crystal display, comprising: a light guide plate, 4, and a light input device, 20, for directing a light path of a light beam, wherein the path of said light beam is directed through a substantially non-solid medium, prior to being directed toward said light guide.

APA does not explicitly disclose directing a light path of a light beam substantially to a rear side of said light input device in a direction away from the light guide prior to directing said light path to a front side thereof and toward the light guide to obtain high focusing of the light beam.

Matsushita teaches in the first embodiment, Figure 1, the use of a light input device wherein a light shielding plate, 10, is disposed so that part of the light emitted from the linear light source and reflected by the reflecting plate, 11, is condensed (Applicant's high focusing) at the end portion (col. 6, lines 22-29) of the light conduction plate, 3 (Applicant's light guide), in order to improve display visibility so the LCD can be formed as a vehicle-mounted alarm display device for displaying various alarms (Abstract). As can be seen in Figure 1, the light is substantially directed to a rear side of said light input device in a direction away from the light guide prior to directing said light path to a front side thereof and toward the light guide to obtain high focusing of the light beam.



Matsushita is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a light input device wherein a light shielding plate is disposed so that part of the light emitted from the linear light source and reflected by the reflecting plate is condensed (Applicant's high focusing) at the end portion of the light conduction plate in order to improve display visibility so the LCD can be formed as a vehicle-mounted alarm display device for displaying various alarms.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA by directing a light path of a light beam substantially to a rear side of said light input device in a direction away from the light guide prior to directing said light path to a front side thereof

and toward the light guide to obtain high focusing of the light beam of Matsushita in order to improve display visibility so the LCD can be formed as a vehicle-mounted alarm display device for displaying various alarms.

As to claim 2, APA discloses the back light unit according to claim 1, further comprising: a light guide plate, 4, for allowing the light beam from the light input device to progress in the vertical direction of a liquid crystal panel in order for the light to pass up through the liquid crystal panel and be seen by the viewer located in a substantially vertical direction from the liquid crystal panel plane.

5. Claims 3-5, 7, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view Matsushita, as applied to claims 1 and 2 above, and further in view of Oyama et al (Oyama) USPAT 5,808,708.

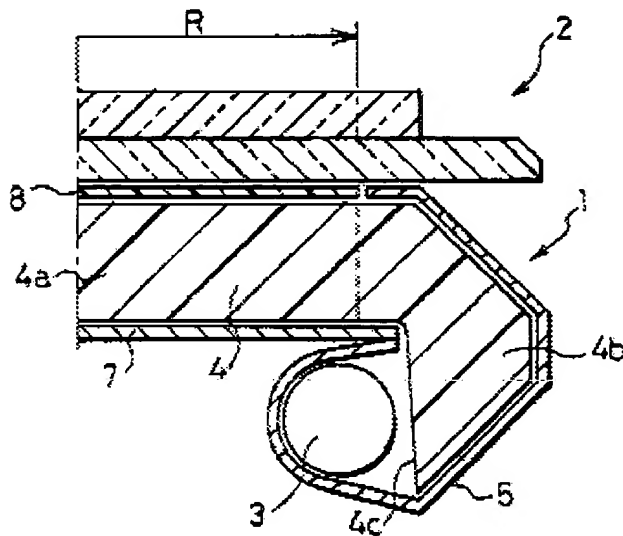
As to claims 3, 4, and 19, APA in view of Matsushita discloses the back light unit according to claim 2, and a light input device, 20, including: a lamp, 22, for generating the light beam; and a lamp housing, 24, reflective on the inner side thereof to lead a light path of the light beam generated from the lamp into the rear side thereof.

APA in view of Matsushita does not explicitly disclose a light-guide plate installed at height different from the light input.

Oyama teaches in Figure 4 a light unit comprising a light-guide plate, 4a, and a reflector, 5, having a sectional view of spiral shape that efficiently guides the light

(Applicant's high focus) from the light source to the light guide plate (col. 6, lines 13-24).

FIG. 4



Oyama teaches in Figure 4 a light-guide plate, 4a, installed at height different from the light, 3, input to reduce the outside dimensions of the entire apparatus with respect to the area of the display space (col. 2, lines 53-60) having a sectional view of spiral shape, resulting in light passed through the light input device to be incident into the light-guide plate without being incident directly to the light-guide plate. Note this motivation (to reduce the outside dimensions of the entire apparatus) is applicable regardless of element 4b.

Oyama is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a light-guide plate installed at height different from the light input to reduce the outside dimensions of the entire apparatus with respect to the area of the display space, resulting in light passed through the light

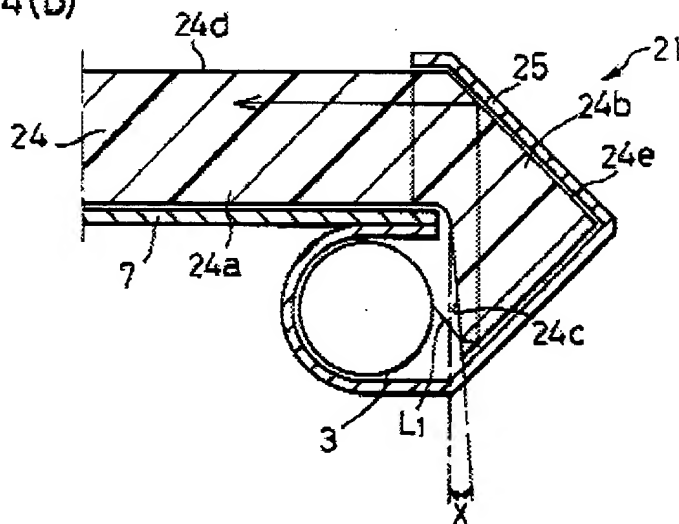
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input device to be incident into the light-guide plate without being incident directly to the light-guide plate.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view of Matsushita with the light-guide plate installed at height different from the light input device of Oyama, resulting in light passed through the light input device to be incident into the light-guide plate without being incident directly to the light-guide plate, to reduce the outside dimensions of the entire apparatus with respect to the area of the display space.

As to claim 5, Oyama teaches in Figure 14(b) a back light unit wherein the reflective plate, 25, is curved to obtain a desired vertical incident angle of the light beam progressing to the light-guide plate to reduce bright lines in the display near the light source (col. 13, lines 33-52, especially lines 42-48).

FIG.14(b)



Oyama is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use a light unit wherein the reflective plate is curved to obtain a desired vertical incident angle of the light beam progressing to the light-guide plate to provide desired illumination characteristics.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view of Matsushita with the curved reflective plate of Oyama.

As to claim 7, Oyama teaches in Figure 14(a) a back light unit wherein the lamp housing includes at least one reflective plate for cutting off the light beam progressing directly from the lamp into the light-guide plate, the at least one reflective plate being a protrusion of the inner surface of the lamp housing.

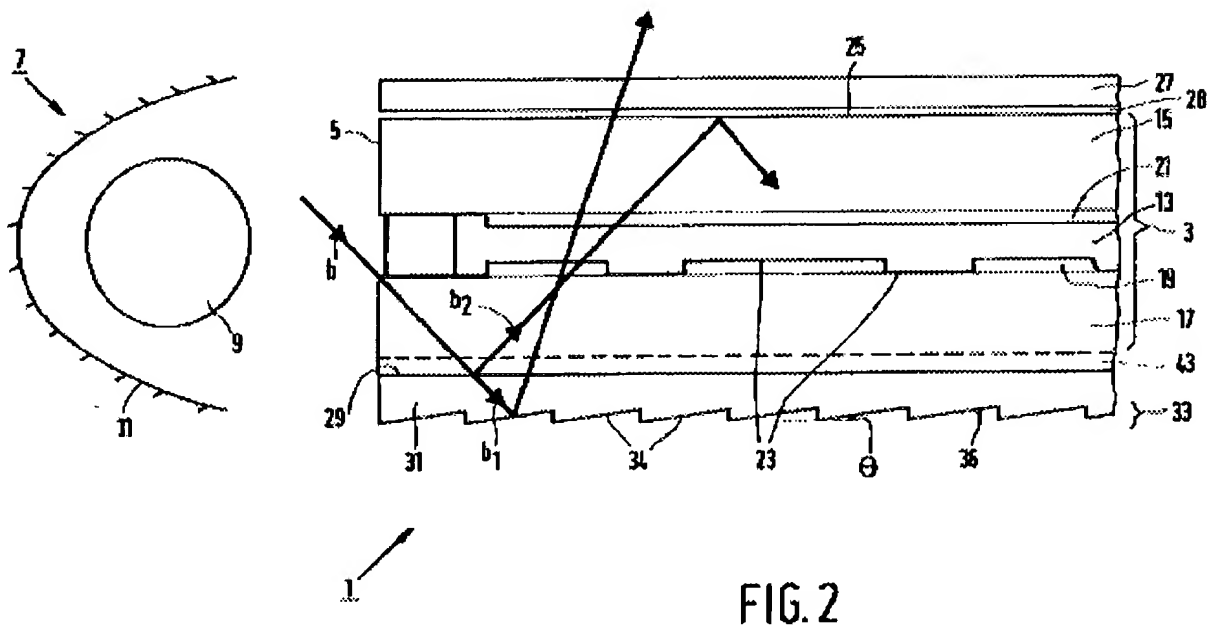
Oyama is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use a reflective plate for cutting off the light beam progressing directly from the lamp into the light-guide plate, the at least one reflective plate being a protrusion of the inner surface of the lamp housing to provide desired illumination characteristics.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view of Matsushita with the protruding reflective plate of Oyama.

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6. Claims 8, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Matsushita, as applied to claim 2 above, in view of Broer et al (Broer) USPAT 5,808,713.

As to claims 8, and 11, Broer teaches in Figure 2 a back light unit wherein the light-guide plate includes a plurality of unit patterns formed on one side thereof in parallel with the lamp, the plurality of unit patterns allowing the light beam from the lamp housing to be progressing perpendicularly into the liquid crystal panel.



Broer is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use a light unit wherein the light-guide plate includes a plurality of triangular section unit patterns formed on one side thereof in parallel with the lamp, the plurality of unit patterns to cause the light beam from the lamp

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housing to be progressing perpendicularly into the [front of the (claim 16 only)] liquid crystal panel.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view of Matsushita with the triangular section unit patterns of Oyama.

As to claim 13, APA discloses in Figures 1 and 2, the use of a back light unit wherein the light-guide plate is disposed at the rear side of transmissive liquid crystal panel (not illustrated, but on page 1, lines 14-22), and the lamp housing, 24, leads the light beam from the lamp to the incident side of the light-guide plate, 4, disposed at the rear side of the transmissive liquid crystal panel.

As to claim 14, APA discloses in Figures 1 and 2, a back light unit further comprising a rear reflective plate, 2, for reflecting the light beam from the rear surface of the light-guide plate, 4, toward the transmissive liquid crystal panel.

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Matsushita and Broer as applied to claim 14, and further in view of Kim USPAT 6,151,169.

As to claim 15, over APA in view of Matsushita and Broer teaches the use of a back light unit according to claim 14.

APA in view of Matsushita and Broer does not teach a light unit wherein the light-guide plate includes a plurality of prism patterns arranged on another surface thereof in intersection with the unit patterns.

Kim teaches in Figure 7 the use of a light unit wherein the light-guide plate includes a plurality of prism patterns arranged on another surface thereof in intersection with the unit patterns.

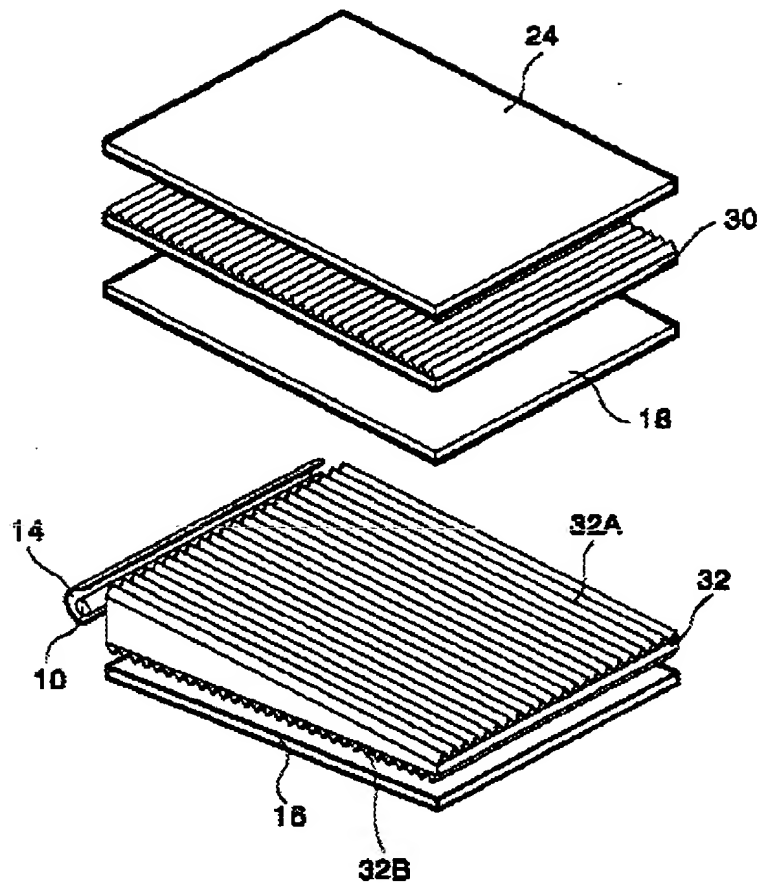


FIG. 7

Kim is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a plurality of prism patterns arranged on another surface thereof in intersection with the unit patterns to enhance the utilization ratio of the light generated by the lamp (col. 6, line 58 through col. 7, line 15).

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view of Matsushita and Broer with the plurality of prism patterns arranged on another (upper) surface of the light guide plate of Kim.

8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Matsushita and Broer as applied to claim 8, and further in view of Egawa et al (Egawa) USPAT 6,295,104 B1.

As to claim 16, APA in view of Oyama and Broer teach a transmissive liquid crystal panel with a the back light unit according to claim 8, wherein the lamp housing leads the light beam from the lamp to the incident side of the light-guide plate.

APA in view of Oyama and Broer do not explicitly disclose a light unit wherein the light-guide plate is disposed at the front side of the liquid crystal panel.

Egawa teaches in Figures 1 and 2 a light guide plate dispose on the front side of a liquid crystal panel to provide illumination without degrading contrast and without generating a moiré pattern (col. 4, lines 11-17).

FIG. 1

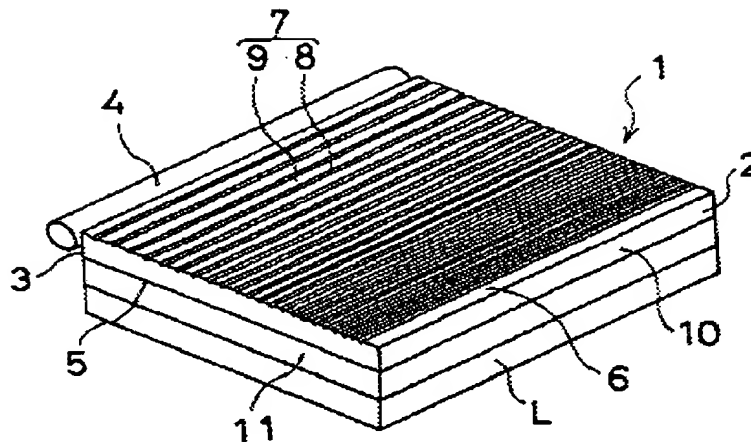
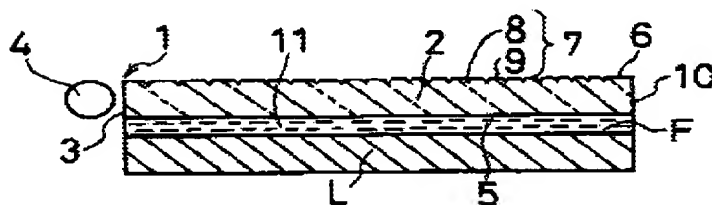


FIG. 2



Egawa is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a light guide plate disposed on the front side of a liquid crystal panel to provide illumination without degrading contrast and without generating a moiré pattern.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view of Matsushima and Broer with the light guide plate disposed on the front side of a liquid crystal panel of Egawa.

As to claim 18, APA in view of Matsushita and Broer teach the back light unit according to claim 8.

APA in view of Matsushita and Broer do not explicitly disclose a distance between the unit patterns that gets gradually shorter as said unit patterns get farther away (Applicant's is gradually short as far away) from the incident side of the light-guide plate.

Egawa teaches in Figures 1 and 2 a light guide plate wherein a distance between the unit patterns that gets gradually shorter as said unit patterns get farther away from the incident side of the light-guide plate so that the brightness becomes nearly uniform at any position in the transparent substrate (light guide) without being influenced by the distances from the light source lamp (col. 12, lines 34-50).

Egawa is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a distance between unit patterns that gets gradually shorter as said unit patterns get farther away from the incident side of the light-guide plate so that the brightness becomes nearly uniform at any position in the light guide without being influenced by the distances from the light source lamp.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of APA in view of Matsushita and Broer with the distance between unit patterns that gets gradually shorter of Egawa.

Allowable Subject Matter

9. Claims 6, 9, 10, 12, and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 6, relevant prior art of record did not disclose, alone or in combination, the light unit according to claim 3, wherein the reflective *plate is curved to have about $\pm 20^\circ$ to 30° in a vertical incident angle of the light beam* progressing to the light-guide plate. The closest combination is APA in view of Matsushita and Oyama, but the claimed structure is not disclosed.

As to claim 9, relevant prior art of record did not disclose, alone or in combination, the light unit according to claim 8, wherein the unit pattern includes: *a land protruded at a desired incline from one surface of the light-guide plate; and a groove extended from the land to have a desired incline.* The closest combination is APA in view of Matsushita and Broer, but the claimed structure is not disclosed.

Claim 10 is dependent upon claim 9 with allowable subject matter above.

As to claim 12, relevant prior art of record did not disclose, alone or in combination, the light unit according to claim 11, wherein *an angle between one surface of the light-guide plate and one surface of the groove is about 40° to 50°, and an angle between one surface of the light-guide plate and another surface of the groove is about 30° to 90°*. The closest combination is APA in view of Matsushita and Broer, but the claimed structure is not disclosed.

As to claim 17, relevant prior art of record did not disclose, alone or in combination, the light unit according to claim 16, wherein *a distance between the start point and the angular point of the land is within 200 μ m*. The closest combination is APA in view of Matsushita, Broer, and Egawa, but the claimed structure is not disclosed.

Response to Arguments

Applicant's arguments filed on 09 July 2003 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are as follows:

(1) Matsushita teaches light that is also directed upward directly towards the display.

(2) Matsushita does not disclose light directed entirely through a substantially non-solid medium, prior to being directed toward a light guide plate.

Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that Matsushita may disclose light paths in addition to those applied in making a rejection. Additional functions of the prior art do not preclude the application of those functions that read on the claimed invention.

(2) It is respectfully pointed out that Matsushita discloses light directed entirely through a substantially non-solid medium (air), prior to being directed toward a light guide plate per rejection above. Note that entirely is considered to modify medium; entirely is not considered to modify the quantity of light. In other words, the claim is considered to say that at all of the light that is directed toward the light guide plate has been directed entirely through a substantially non-solid medium, the claim is NOT considered to say that all of the light is so directed, and in fact, there are no materials that could achieve 100 % direction of the light due to absorption losses.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (703) 305-0418. The examiner can normally be reached on Monday through Thursday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

Timothy L Rude
Examiner
Art Unit 2871

TLR
September 25, 2003


ROBERT H. KIM
SUPERVISOR AND EXAMINER
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